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1: JAMA. 1993 Jul 28;270(4):490-3.

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- JAMA. 1994 Feb 23;271(8):584-5.

Involuntary smoking in the restaurant workplace. A review of employee exposure and health effects.

Siegel M.

University of California, Berkeley/University of California.

OBJECTIVE--To determine the relative exposure to environmental tobacco smoke for bar and restaurant employees compared with office employees and with nonsmokers exposed in the home (part 1) and to determine whether this exposure is contributing to an elevated lung cancer risk in these employees (part 2). **DATA SOURCES**--MEDLINE and bibliographies from identified publications. **STUDY SELECTION**--In part 1, published studies of indoor air quality were included if they reported a mean concentration of carbon monoxide, nicotine, or particulate matter from measurements taken in one or more bars, restaurants, offices, or residences with at least one smoker. In part 2, published epidemiologic studies that reported a risk estimate for lung cancer incidence or mortality in food-service workers were included if they controlled, directly or indirectly, for active smoking. **DATA EXTRACTION**--In part 1, a weighted average of the mean concentration of carbon monoxide, nicotine, and respirable suspended particulates reported in studies was calculated for bars, restaurants, offices, and residences. In part 2, the relative lung cancer risk for food-service workers compared with that for the general population was examined in the six identified studies. **DATA SYNTHESIS**--Levels of environmental tobacco smoke in restaurants were approximately 1.6 to 2.0 times higher than in office workplaces of other businesses and 1.5 times higher than in residences with at least one smoker. Levels in bars were 3.9 to 6.1 times higher than in offices and 4.4 to 4.5 times higher than in residences. The epidemiologic evidence suggested that there may be a 50% increase in lung cancer risk among food-service workers that is in part attributable to tobacco smoke exposure in the workplace. **CONCLUSIONS**--Environmental tobacco smoke is a significant occupational health hazard for food-service workers. To protect these

workers, smoking in bars and restaurants should be prohibited.

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*** Author:** Center for Tobacco Research and Intervention, University of Wisconsin Medical School.

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INSIGHTS: SMOKING IN WISCONSIN

A series of papers on Wisconsin tobacco use with recommendations for action, based on the 2003 Wisconsin Tobacco Survey of 8,000 Wisconsin adults.

Secondhand Smoke: Awareness, Attitudes and Exposure Among Wisconsin Residents

Series 2, Paper Number 4

UW-CTRI

Center for Tobacco Research and Intervention
University of Wisconsin Medical School



University of Wisconsin
Comprehensive Cancer Center



The Wisconsin Department
of Health and Family
Services

EXECUTIVE SUMMARY

Since the 1986 U.S. Surgeon General's Report, *The Health Consequences of Involuntary Smoking*, first made Americans aware of the dangers of secondhand smoke, our understanding of the health consequences of environmental tobacco smoke for both nonsmoking adults and children has expanded greatly. In Wisconsin, secondhand smoke is estimated to cause 700 lung cancer and heart disease deaths each year and thousands more are made seriously ill by asthma, allergic attacks and infectious disease.¹

The 2003 Wisconsin Tobacco Survey (WTS) interviewed over 8,000 Wisconsin smokers, former smokers and never smokers regarding secondhand smoke. This report summarizes the WTS findings and offers recommendations based on those findings. According to the WTS, Wisconsin residents agree that secondhand smoke is harmful, prefer smokefree environments (especially their homes and workplaces) and support of smokefree policies. In fact, approximately 94% of Wisconsin residents overall agree that secondhand smoke is harmful, including 88% of smokers. Younger residents (18-24 year olds) are more likely to find secondhand smoke dangerous than older Wisconsinites. Exposure to secondhand smoke occurs more often, however, among workers with less education, primarily those working in the service/hospitality and manufacturing sectors. These workers are more likely to support changes in smoking policies than those working in sectors where environments are more likely to be smokefree.

Survey respondents generally support smokefree environments, especially in the home and workplace. Respondents were very likely to restrict smoking in their **homes**. Close to 70% of Wisconsin households reported that they completely prohibit smoking. An additional 10% allow smoking in some places or at some times. Only three percent of respondents allow smoking at all times in their home.

Regarding **workplaces**, close to 75% of respondents believe that smoking should not be allowed in indoor work areas (including 55% of smokers). Black respondents preferred stronger workplace policies than Whites. Workers in the entertainment, lodging and recreation industries in particular supported stronger workplace policies on smoking.

While the past ten years has seen a reduction in exposure to secondhand smoke in the workplace, this reduction has not been uniform. Employees of restaurants, taverns and manufacturing facilities, as well as racial and ethnic minorities are more often exposed to secondhand smoke than other groups. Approximately twice as many respondents with a high school education or less were exposed to secondhand smoke in their workplace compared to those with a college degree or more.

Moreover, there was strong support for smokefree **restaurants**. More than 70% of respondents reported that they would support local laws making restaurants smokefree including three-quarters of nonsmokers and half of smokers. More women support smokefree restaurants than men as do more Blacks than Whites. Smokefree restaurants were also more attractive to respondents as customers. Half said they would be more likely to dine in a smokefree restaurant while only six percent said they would be less likely.

Finally, close to two-thirds of respondents supported policies that require **bars and taverns** to be either smokefree or only allow smoking in specific areas. This contrasts with the current situation where few bars are smokefree or have smoking restrictions.

^{xi} **Author:** Fontham, et al.

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Lung Cancer in Nonsmoking Women: A Multicenter Case-Control Study¹

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Abstract

The association between exposure to environmental tobacco smoke and lung cancer in female lifetime nonsmokers was evaluated using data collected during the first 3 years of an ongoing case-control study. This large, multicenter, population-based study was designed to minimize some of the methodological problems which have been of concern in previous studies of environmental tobacco smoke and lung cancer. Both a cancer control group and a population control group were selected in order to evaluate recall bias. A uniform histopathological review of diagnostic material was conducted for case confirmation and detailed classification. Biochemical determination of current exposure to tobacco and screening of multiple sources of information to determine lifetime nonuse were utilized to minimize misclassification of smokers as nonsmokers.

A 30% increased risk of lung cancer was associated with exposure to environmental tobacco smoke from a spouse, and a 50% increase was observed for adenocarcinoma of the lung. A statistically significant positive trend in risk was observed as pack-years of exposure from a spouse increased, reaching a relative risk of 1.7 for pulmonary adenocarcinoma with exposures of 80 or more pack-years. The predominant cell type of the reviewed, eligible lung cancer cases was adenocarcinoma (78%). Results were very similar when cases were compared to each control group and when separate analyses were

conducted for surrogate and personal respondents. Other adult-life exposures in household, occupational, and social settings were each associated with a 40-60% increased risk of adenocarcinoma of the lung. No association was found between risk of any type of lung cancer and childhood exposures from a father, mother, or other household members.

Introduction

Approximately one decade has passed since the initial reports of increased risk of lung cancer in nonsmoking women married to smokers (1, 2). The ensuing studies have provided a body of data which suggests a small but significant elevation in risk of lung cancer associated with exposure to ETS³ (3-22). In reported prospective studies exposure has been assessed by the spouse's smoking history, primarily that of husbands. In case-control studies, the primary ETS exposure assessed has also been that from a spouse, although exposures from parents, other household exposures, and the workplace have been examined in some studies.

In general, these studies have included fewer than 100 nonsmoking lung cancer cases whose self-reported smoking status has not been validated by biochemical determination or other means. Reviews of available studies of ETS and lung cancer in nonsmokers by the National Research Council (23), the International Agency for Cancer Research (24), and others (25, 26) have concluded that although misclassification is unlikely to account for all of the observed increased risk, some misclassification of current or former smokers as nonsmokers is likely (0.5-5.0%). Because smokers tend to marry smokers, misreporting may introduce some bias in the estimation of the magnitude of the observed effect.

This study was undertaken in 1985 in an effort to address a number of unresolved issues related to ETS:

(a) *Misclassification of Smoking Status.* Multiple sources of information are utilized to ascertain nonsmoking status (medical record, physician, and then the study subject or surrogate). Study respondents are questioned twice (at contact to set up the interview and at the beginning of the interview). Self-reported current nonsmoking status is corroborated by measurement of urinary cotinine.

(b) *Histopathological Specificity.* Microscopic diagnostic slides are reviewed by one pulmonary pathologist both to confirm eligibility of cases as primary lung carcinomas and to provide a detailed review (subtype, differ-

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³ The abbreviations used are: ETS, environmental tobacco smoke; SEER, Surveillance, Epidemiology, and End Result; OR, odds ratio; CI, confidence interval.

entiation) and classification of the histopathological cell type.

(c) *Recall Bias.* Two control groups, one with colon cancer and one from the general population, are selected for case-control comparisons. Differential recall between cases and colon cancer controls should be minimized since both groups are similarly motivated to recall earlier exposures.

(d) *Source of ETS Exposure.* Information on childhood exposures from a father, mother, and other household members and adult exposures from husband(s), other household members, and occupational and social settings is obtained by questionnaire. The risk associated with exposure to ETS from different sources and during different time periods can be evaluated.

(e) *Confounders and Other Risk Factors.* Because the magnitude of the main ETS effect is expected to be small, it is important to take into account potential confounding factors and effect modifying factors in a study with a sufficiently large number of cases and controls. It is anticipated that upon completion of this study about 600 cases and twice that number of controls will have participated.

This report represents findings from the ongoing study and includes the largest number of lifetime nonsmokers with lung cancers reported to date. This report was felt to be justified given the public health importance of the issue under investigation.

Methods

The study is a population-based case-control study of lung cancer in women who have never used any tobacco product. This preliminary report includes cases diagnosed during the first three years (December 1, 1985 through December 31, 1988) of a 5-year study. At the time of diagnosis cases were residents of one of five major metropolitan areas throughout the United States, including Atlanta (Clayton, Cobb, DeKalb, Fulton, and Gwinnett counties), Houston (Galveston and Harris counties), Los Angeles (Los Angeles County), New Orleans (Jefferson, Orleans, and St. Bernard parishes), and the San Francisco Bay Area (Alameda, Contra Costa, Marin, San Francisco, San Mateo, and Santa Clara counties), representing a population of approximately 18.5 million people or 8% of the U. S. population.

Case and Control Selection

Rapid case ascertainment procedures, which included review of pathology reports from study hospitals, were utilized to identify potentially eligible lung cancer cases. Eligible cases included English-, Spanish-, or Chinese-speaking females, aged 20-79, who had a histopathologically confirmed diagnosis of primary carcinoma of the lung (International Classification of Disease, 9th Revision, code 162) made prior to death, had no history of previous cancer, and who were lifetime nonusers of tobacco. Lifetime nonusers of tobacco are defined for this study as persons who had smoked fewer than 100 cigarettes and had not used any other form of tobacco for more than 6 months.

Two control groups were selected. The first control group, referred to as the population control group, was selected by random digit dialing and supplemented by random sampling from the files of the Health Care Fi-

nancing Administration for women aged 65 and older. Controls were frequency matched to cases on age (<50, 50-59, 60-69, 70+ years) in a 2:1 control:case ratio. They met the same eligibility criteria as cases for age, residence, language, and tobacco use.

Females, aged 20-79, with a diagnosis of primary carcinoma of the colon (International Classification of Disease, 9th Revision, code 153) who met the language, previous cancer, lifetime nonsmoking, and residential eligibility criteria of the cases, were identified and frequency matched to lung cancer cases by 10-year age groups and race. This second control group was selected because there is no established increased risk of colon cancer associated with either active or passive smoking, and it provided an opportunity to examine the issue of recall bias associated with a recent diagnosis of cancer.

A multistep procedure was used to determine lifetime smoking status. After identification of a potentially eligible lung cancer case or colon cancer control, the hospital chart was reviewed to obtain demographic data and available information on tobacco use. Patients identified as current or former smokers in the medical record were considered ineligible. In study areas where individual physician notification was required/preferred, the tobacco use history was requested from the physician for potentially eligible cases and colon controls identified as nonusers of tobacco or with unknown smoking status according to the hospital record. Women who were identified as current or former smokers by their physicians were considered ineligible. All remaining cases and colon cancer controls believed to be nonsmokers or with unknown smoking status were contacted by telephone to elicit information on tobacco use. Women who reported ever smoking 100 or more cigarettes or using any other form of tobacco for more than 6 months were considered ineligible. The identical telephone screening procedure was used for the population control group. At the time of the interview, the tobacco use screening questions were repeated to confirm each study subject's reported nonuse of tobacco.

The questionnaire was translated from English into Spanish and Chinese, and interviewers fluent in those languages conducted the non-English as well as English interviews. Interviews were completed for 431 of 514 incident cases (84%), 358 of 489 colon cancer controls (73%), and 794 of 1105 population controls (72%). Sixty-one (3.8%) of the interviews were conducted in Spanish ($n = 14$) or Chinese ($n = 47$): 22 cases (5%); 23 colon cancer controls (6%); and 16 population controls (1.5%). A next-of-kin interview was solicited for lung cancer cases and colon cancer controls who were too ill or deceased. All population controls were self-respondents because of the sampling method used to identify these controls. A total of 143 lung cancer case interviews and 35 of 352 colon cancer control interviews were conducted with next-of-kin respondents, representing 34% and 10% of the eligible respondents.

An extensive structured questionnaire obtained information concerning household, occupational, and other exposures to environmental tobacco smoke during the study subject's lifetime. Data were also collected on lifetime occupational history, usual adult diet, family and personal medical histories, and other exposures of interest, which are not included in this report.

Table 4 Distribution of lung cancer cases and controls according to selected demographic characteristics

	Lung cancer cases (n = 240)		Colon cancer controls (n = 351)		Population controls (n = 780)	
	No.	(%)	No.	(%)	No.	(%)
Study center						
Atlanta	46	(11.0)	44	(12.5)	76	(9.7)
Houston	39	(9.3)	35	(10.0)	24	(3.1)
Los Angeles	160	(38.1)	125	(35.6)	358	(45.9)
New Orleans	26	(6.2)	18	(5.1)	44	(5.6)
San Francisco Bay Area	149	(35.5)	129	(36.7)	278	(35.6)
Respondent						
Study subject	277	(66.0)	316	(90.1)	780	(100.0)
Next of kin	143	(34.0)	35	(9.9)		
Age (years)						
20-29	5	(1.2)	1	(0.3)	9	(1.2)
30-39	11	(2.6)	13	(3.7)	42	(5.4)
40-49	23	(5.5)	22	(6.3)	30	(3.9)
50-59	73	(17.3)	55	(15.6)	121	(15.5)
60-69	147	(35.0)	105	(29.8)	221	(28.3)
70-79	161	(38.3)	155	(44.0)	357	(45.8)
Race/ethnic group						
White	266	(63.3)	240	(68.5)	503	(64.5)
Black	44	(10.5)	59	(16.8)	107	(13.7)
Hispanic	32	(7.6)	14	(4.0)	42	(5.4)
Asian	67	(16.0)	35	(10.0)	113	(14.5)
Other	11	(2.6)	2	(0.6)	13	(1.7)
Unknown/refused to answer	0	(0.0)	1	(0.2)	2	(0.4)
Annual income						
<\$8,000	72	(17.1)	60	(17.1)	98	(12.6)
\$8,000-12,999	63	(15.0)	52	(14.8)	115	(14.7)
\$13,000-19,999	48	(11.4)	48	(13.7)	110	(14.1)
\$20,000-34,999	73	(17.4)	61	(17.4)	153	(19.6)
\$35,000-49,999	37	(8.8)	49	(14.0)	82	(10.5)
≥\$50,000	59	(14.1)	35	(10.0)	128	(16.4)
Unknown/refused to answer	68	(16.2)	46	(13.1)	94	(12.0)
Education						
Less than high school	135	(32.1)	84	(23.9)	165	(21.2)
High school	140	(33.3)	134	(38.2)	246	(31.5)
Some college	71	(16.9)	74	(21.1)	181	(23.2)
College	33	(7.9)	28	(8.0)	107	(13.7)
Graduate	25	(6.0)	22	(6.3)	69	(8.9)
Unknown	16	(3.8)	9	(2.6)	12	(1.5)
Usual childhood residence						
Farm	93	(22.1)	78	(22.2)	131	(16.8)
Rural area	49	(11.7)	36	(10.3)	61	(7.8)
<20,000 population	92	(21.9)	81	(23.1)	196	(25.1)
20,000-49,999 population	37	(8.8)	46	(13.1)	98	(12.6)
≥50,000 population	146	(34.8)	109	(31.1)	291	(37.3)
Unknown	3	(0.7)	1	(0.3)	3	(0.4)
Usual adult residence						
Farm	23	(5.5)	15	(4.3)	10	(1.3)
Rural area	10	(2.4)	6	(1.7)	13	(1.7)
<20,000 population	39	(9.3)	28	(8.0)	45	(5.8)
20,000-49,999 population	53	(12.6)	61	(17.4)	108	(13.9)
≥50,000 population	293	(69.8)	240	(68.4)	601	(77.0)
Unknown	2	(0.5)	1	(0.3)	3	(0.4)

mates were statistically significant, and they did not significantly differ from one another.

Estimates of relative risk associated with the number of cigarettes smoked by a spouse were significantly elevated only in the highest exposure category, 40 or more

cigarettes/day: 2.06 (1.19-3.54) and 1.69 (1.28-2.61) for adenocarcinoma of the lung comparing cases to colon cancer and population controls, respectively. Odds ratios were similar, although slightly lower, for all types of lung cancer combined: 1.70 (1.02-2.84) and 1.36 (0.90-2.06).

Pack-years were examined as a combined measure of duration and dose of exposure to the husband's cigarette smoking. The odds ratios for all cell types of lung cancer combined and for adenocarcinoma of the lung are displayed in Fig. 1. Separate analyses were conducted with each control group for comparison. Because the findings were so similar for each group, the results are presented for the two control series combined (n = 1131). An increasing risk of lung cancer and adenocarcinoma of the lung associated with an increasing level of exposure to the spouse's cigarette smoking was found. The positive trend in risk by pack-years of exposure is statistically significant for adenocarcinoma of the lung ($P < 0.01$). A weaker dose response is observed when all histopathological types of lung cancer are combined (trend, $P = 0.07$).

Exposure to ETS from various sources during adult life was evaluated. The results are summarized in Table 6. For simplicity of presentation, the data in this table also represent the findings using the two control groups combined because the individual results using each control group were entirely consistent. Exposures to cigarette smoking from spouse(s), other household members, on the job and in other activities of adult life ("social") are each associated with an overall 40-60% significant elevation in the risk of adenocarcinoma of the lung. As noted previously for spouse-related exposures, the risk estimates for all lung cancers without regard to cell type tend to be slightly lower than the comparable estimates for adenocarcinoma of the lung. Significant positive trends ($P < 0.05$) in risk of adenocarcinoma of the lung were associated with increasing duration (years) of exposure to cigarette smoke from a spouse, other household members, and social occasions. For adult household exposures from a spouse and others, estimates of risk rose from lowest to highest in the 30 or more years of exposure category; however, trends were not smooth for exposures in occupational and social settings.

No association was found between risk of any type of lung cancer and childhood exposure to cigars, pipes, cigarettes, or all types of tobacco combined. Table 7 presents the estimated relative risks of lung cancer and adenocarcinoma of the lung among nonsmoking women whose father, mother, or other household member smoked during childhood. None differed significantly from unity. Years of exposure and amount smoked were also examined. No significant elevations in risk were found at any level of smoking by household members during childhood.

Discussion

One of the most striking findings of this study is the distribution of the histopathological cell types of lung cancer in a population-based series of cases well screened to determine lifetime nonsmoker status. Seventy-eight % of 359 reviewed eligible cases in this report were classified as adenocarcinomas. This high proportion of adenocarcinomas and the paucity of squamous and small cell carcinomas was consistent across all study

Table 5 Association between smoking status of spouse(s) and lung cancer risk^a: all lung cancer and adenocarcinoma of the lung

Spouse ever smoked tobacco (by type)	Cases	Colon cancer controls	Population controls	Adjusted odds ratio ^a	
				Colon cancer controls (OR (95% CI))	Population controls OR (95% CI)
All lung carcinomas	(n = 420)	(n = 351)	(n = 780)		
Any type of tobacco	294	231	492	1.28 (0.93-1.75)	1.29 (0.99-1.69)
Cigarettes	264	209	441	1.17 (0.87-1.59)	1.20 (0.93-1.55)
Cigars	64	54	97	1.14 (0.76-1.71)	1.26 (0.88-1.80)
Pipe	63	52	110	1.17 (0.78-1.77)	1.21 (0.85-1.72)
Adenocarcinoma	(n = 281)	(n = 351)	(n = 780)		
Any type of tobacco	203	231	492	1.44 (1.01-2.05) ^b	1.47 (1.08-2.01) ^b
Cigarettes	184	209	441	1.31 (0.94-1.84)	1.36 (1.02-1.84) ^b
Cigars	41	54	97	1.05 (0.67-1.66)	1.15 (0.76-1.74)
Pipes	44	52	110	1.16 (0.74-1.82)	1.20 (0.81-1.79)

^a Adjusted for age (continuous), race (white, black, other), study area (Los Angeles, San Francisco Bay Area, Southern U.S.: Atlanta, Houston, and New Orleans), annual family income (<\$13,000, \$13,000-\$34,999, \$35,000+), and education (<high school degree, high school degree, some college or higher).

^b $P < 0.05$.

centers. In the study of Kabat and Wynder (8), a similar proportion (74%) of Kreyberg II type tumors was found in their series of 97 nonsmoking females whose self-reported nonsmoking status was confirmed by chart review. In the United States adenocarcinoma is the most common histopathological cell type of primary lung cancer in women, but the proportion of all female lung cancer cases with all subtypes of adenocarcinomas (papillary, acinar, bronchioloalveolar, and solid) is 34% (SEER Public User Tape, 1978-1987).

Our study, in which adenocarcinoma is predominant and is the cell type clearly associated with increased risk

from adult ETS exposures, is in contrast to several of the earlier studies of involuntary exposure to ETS. Trichopoulos *et al.* (2) in the initial case-control study of lung cancer and passive smoking among nonsmoking women excluded cases of adenocarcinoma including bronchioloalveolar; however, that study included no histopathological review. They reported an odds ratio from 1.8 to 3.4 associated with the husband's smoking habits. Dalgner *et al.* (16) reported a 3-fold elevated risk associated with the spouse's smoking only for squamous and small cell carcinomas and no increased risk of other cell types, of which adenocarcinoma and its subtype, bronchioloal-

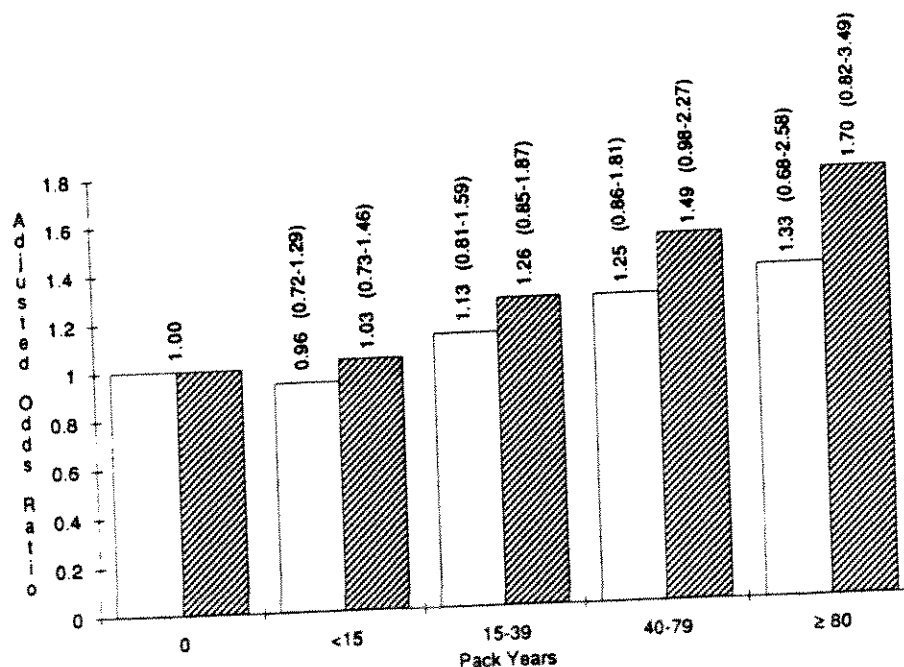


Fig. 1. Adjusted odds ratios for all lung cancer and for adenocarcinoma of the lung associated with pack-years of exposures from spouse(s). □, all lung cancer, trend $P = 0.07$; ▨, adenocarcinoma, trend $P < 0.01$.

Table 6 Association between risk^a of lung cancer and adult exposures to cigarette smoke among nonsmoking women

Years of exposure by source	All lung carcinomas adjusted odds ratio ^a (95% CI)	Adenocarcinoma of the lung adjusted odds ratio ^a (95% CI)
Household exposure		
Spouse		
Ever exposed ^b	1.21 (0.96-1.54)	1.38 (1.04-1.82) ^c
0 years	1.00	1.0
1-15	1.19 (0.88-1.61)	1.33 (0.93-1.89)
16-30	1.14 (0.82-1.59)	1.40 (0.96-2.05)
>30	1.25 (0.91-1.72)	1.43 (0.99-2.09)
	Trend <i>P</i> = 0.14	Trend <i>P</i> = 0.03
Other household members		
Ever exposed ^b	1.23 (0.97-1.56)	1.39 (1.05-1.82) ^c
0 years	1.00	1.00
1-5	1.20 (0.90-1.61)	1.36 (0.98-1.89)
6+ ^d	1.23 (0.89-1.69)	1.35 (0.93-1.94)
	Trend <i>P</i> = 0.12	Trend <i>P</i> = 0.04
Occupational exposure		
Ever exposed ^b	1.34 (1.03-1.73) ^c	1.44 (1.06-1.97) ^c
0 years	1.00	1.00
1-15	1.23 (0.86-1.77)	1.58 (1.05-2.39) ^c
16-30	1.45 (1.05-2.00) ^c	1.42 (0.97-2.07)
>30	1.30 (0.93-1.80)	1.37 (0.92-2.02)
	Trend <i>P</i> = 0.02	Trend <i>P</i> = 0.10
Social exposure^e		
Ever exposed ^b	1.58 (1.22-2.04) ^c	1.60 (1.19-2.14) ^c
0	1.00	1.00
1-15	1.34 (0.97-1.84)	1.29 (0.89-1.87)
16-30	2.01 (1.29-3.15) ^c	2.40 (1.47-3.90) ^c
>30	1.65 (0.98-2.80)	1.50 (0.78-2.77)
	Trend <i>P</i> = 0.0006	Trend <i>P</i> = 0.002

^a Adjusted for age, race, study area, annual income, and education.^b Referent: never exposed.^c *P* < 0.05.^d Too few subjects exposed 16+ years.^e Social exposure is defined as exposure of 2 or more h/week from sources other than occupational and household members, including spouse.^f *P* < 0.01.

veolar carcinoma, comprised 46.1% of the total female nonsmoking cases. In the Swedish study of Pershagen et al. (35), 57% of 77 female nonsmokers were adenocarcinomas and 31% squamous and small cell carcinomas. The only statistically significant ETS-associated increased risk was for squamous and small cell carcinomas, the cell types with the highest relative risks associated with active smoking. At the present time small numbers of squamous cell and small cell carcinomas in our data set preclude an adequate assessment of risk associated with ETS exposures for these cell types.

The findings of our study lend some support to the mechanism proposed by Wynder and Goodman (36) whereby inhalation of sidestream smoke might primarily increase risk of adenocarcinoma of the lung. They suggested that inhalation of sidestream smoke through the nasal passages would hinder deposition of respirable smoke particulates in the periphery of the lung while gaseous components such as volatile *N*-nitrosamines, formaldehyde, acetaldehyde, or nitrogen oxides, would

be likely to reach the deeper part of the lung. Both squamous cell and small cell carcinomas tend to be centrally located, rather than in the periphery of the lung.

Our study found statistically significant elevated risks of adenocarcinoma of the lung among female nonsmokers who had had household ETS exposure or ETS exposure in occupational settings or from other sources. Each of these exposures occurred during adulthood. Exposures during the first 18 years of life were consistently unrelated to the risk of lung cancer.

Any exposure (ever/never) from a spouse who smoked was associated with at least a 30% excess risk. Increasing amount per day and years smoked significantly increased risk. The pattern of risk was the same when cases were compared to colon cancer cases or population controls and was specific for adenocarcinoma of the lung. Findings for all lung cancers combined reflect the association between ETS and adenocarcinoma of the lung diluted by the weak association with other cell types.

The internal consistency of findings with the two control groups suggests that recall bias resulting from having a diagnosis of cancer is not a likely explanation of the observed effect. The possibility remains that nonsmoking lung cancer cases and nonsmoking colon cancer cases are not similarly motivated to remember exposures to the tobacco smoke of others.

The longest duration of exposure to ETS is associated with the greatest elevation in risk, 1.43, for exposure of 30 or more years to a husband's cigarette smoking. Although significant trends were found for other adult exposures, the dose response was not monotonic; relative risk estimates tended to decline in the longest exposure category. One possible explanation is that recall of quantitative measures of exposure is less reliable for exposures outside the home and for household members other than the spouse. A recent ten-country study was carried out by the International Agency for Research on Cancer designed to validate self-reported recent exposure of nonsmoking women to ETS from any source compared with the urinary concentration of cotinine. Duration of daily exposure to ETS from the husband was the strongest predictor of urinary cotinine (37). Studies by Pron et al. (38) and Coultas et al. (39) suggest that quantitative measures, particularly for exposures outside the home, are less reliable than categorical measures.

The lack of any association between childhood ETS exposures and lung cancer in our study, as well as the strong, consistent association with exposures during adulthood, contrasts with two recent reports by Janerich et al. (22) and Wu-Williams et al. (40). Differences in study design may contribute to the discrepant findings. About 25% (*n* = 45) of the 191 cases in the New York study were males, whereas our study was restricted to female cases (*n* = 420) (22). The authors report that there were only small differences between men and women in the amount of exposure to ETS measured by duration. The mean exposure of women to their husbands' tobacco smoke was 16.2 ± 16.7 years, while men had a mean exposure of 13.0 ± 17.0 years from smoking wives. Furthermore, there was a higher correlation between exposure from spouses lifetime ETS exposure for women in the study (*r* = 0.51) than for men (*r* = 0.37). Intensity (dose) of exposure and temporality of exposure from male and female smoker sources may differ considerably. Relatively small differences in dose, temporality, and

^{xii} **Author:** Taylor, A., Johnson, D, & Kazemi, H.

Title: "Environmental Tobacco Smoke and Cardiovascular Disease."

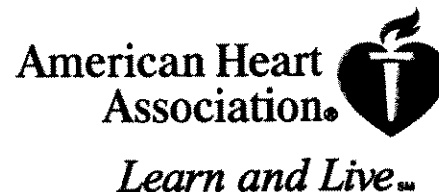
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**Environmental tobacco smoke and cardiovascular disease. A position paper
from the Council on Cardiopulmonary and Critical Care, American Heart
Association**

AE Taylor, DC Johnson and H Kazemi

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AHA Medical/Scientific Statement

Position Statement

Environmental Tobacco Smoke and Cardiovascular Disease

A Position Paper From the Council on Cardiopulmonary and Critical Care, American Heart Association

Aubrey E. Taylor, PhD, Chairman; Douglas C. Johnson, MD,
and Homayoun Kazemi, MD, Members

Cigarette smoking was identified by the Surgeon General in 1982 and 1983 as the most important modifiable risk factor for cancer and chronic heart disease in the United States.^{1,2} Recent studies have implicated exposure to environmental tobacco smoke as a significant risk factor for the development of lung cancer and heart disease. Because more information on environmental tobacco smoke is now available, its health effects are reviewed in this report, with a major emphasis on the relation of environmental tobacco smoke to cardiovascular disease.

Cigarette smoking has a significant effect on the health of Americans, and is a major cause of cardiovascular disease.³ Cardiovascular disease attributable to voluntary cigarette smoking accounts for about as many deaths each year as chronic obstructive pulmonary disease and lung cancer deaths combined. In 1988 approximately 430,000 deaths in adults aged 35 and older were attributed to the intentional inhalation of tobacco smoke. This number included 201,000 deaths due to cardiovascular disease, 112,000 due to lung cancers, 83,000 due to chronic lung disease (including pneumonia, influenza, bronchitis, emphysema, chronic airway obstruction, and other respiratory diseases), and 31,000 due to other cancers.⁴ It has also been estimated that an additional 3,800 lung cancer deaths⁴ and 37,000 cardiovascular deaths occurred in nonsmokers who had been exposed to environmental tobacco smoke.⁵ An additional 2,500 perinatal deaths were estimated to have occurred because of maternal smoking, and about 1,300 deaths resulted from burns related to smoking.⁴

Although the existing epidemiological studies on cancer deaths associated with environmental tobacco smoke may be subject to questions about sample size, exposure, experimental design, and differing lifestyles of populations, sufficient information has been published to implicate environmental tobacco smoke as a definite health hazard. The 1986 Surgeon General's report concluded that involuntary smoking is a cause of

disease, including lung cancer, in healthy nonsmokers, and it was postulated that approximately 3,000–4,000 nonsmokers exposed to environmental tobacco smoke die of lung cancer each year.⁶ The report also concluded that children whose parents smoke have an increased frequency of respiratory infections, increased symptoms of respiratory problems, and slightly smaller rates of increase in lung function as the lung matures compared with children of nonsmoking parents. At the time of the report, environmental tobacco smoke could not be definitely linked to cardiovascular disease. However, since 1986 several studies have been published documenting a link between environmental tobacco smoke, cancer,⁷ and heart disease.^{5,8} The Environmental Protection Agency has also done an extensive study of the effects of environmental tobacco smoke on lung cancer.

Environmental Tobacco Smoke

Burning cigarettes emit two types of smoke: mainstream smoke, which is the smoke directly inhaled into the smoker's lungs, and sidestream smoke, which is the smoke emitted into the air from the burning cigarette between puffs. Environmental tobacco smoke is about 85% sidestream and 15% exhaled mainstream smoke. More than 4,000 chemicals, including at least 40 carcinogens, are contained in environmental tobacco smoke.⁹ Many toxic constituents are found in higher concentrations in sidestream than in mainstream smoke.⁵ For example, in sidestream smoke there is about five times as much carbon monoxide (which decreases the ability of hemoglobin to carry oxygen to the tissues), three times as much benzopyrene (a tumor- and plaque-producing compound), and 50 times as much ammonia (an eye and respiratory irritant) as is inhaled directly from a cigarette. The difference is because the cigarette burns at a higher temperature during inhalation, leading to more complete combustion, and filters also screen some of these toxic compounds.

Those in close proximity to someone smoking a cigarette are exposed to smoke not only while the cigarette is lit but continue to inhale smoke that has mixed with air long after the cigarette is extinguished. Environmental tobacco smoke can persist in indoor environments for many hours after cessation of smoking, the time depending on ventilation and the mixing of

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room air with uncontaminated air.¹⁰ To conserve energy, building ventilation rates are sometimes decreased, causing levels of smoke to increase in workplace environments, and in many homes ventilation of smoke to the outside is minimal.

Risk to Nonsmokers from Environmental Tobacco Smoke

The relative risk of developing lung cancer has been estimated to be 1.3 for nonsmokers exposed to environmental tobacco smoke at home compared with nonsmokers with no exposure to environmental tobacco smoke.^{7,10,12} Active smoking has a relative risk factor for cancer of about 10.¹ Average workplace exposures to environmental tobacco smoke are estimated to increase lung cancer risk twofold because environmental tobacco smoke exposures are generally higher at the workplace than at home.¹² Despite the difficulty of interpreting epidemiological studies of exposure levels in the home and workplace, several recent studies demonstrate a definite link between cardiovascular deaths in nonsmokers exposed to environmental tobacco smoke. Glantz and Parmley⁵ reviewed 10 of these studies, showing that men and women nonsmokers exposed to environmental tobacco smoke at home had an overall cardiovascular relative risk factor of 1.3. This compares to a relative risk factor of 1.7 for smokers compared with nonsmokers.² Kawachi et al¹³ predicted an even higher relative risk factor for workplace exposures of nonsmokers to environmental tobacco smoke.

Repace and Lowrey⁶ evaluated eight studies in which the number of lung cancer deaths of nonsmokers exposed to environmental tobacco smoke averaged $5,000 \pm 2,400$ (mean \pm standard deviation) per year. Assuming that the ratio of lung cancer to heart disease deaths is the same with environmental tobacco smoke exposure as for voluntary smoking, approximately 10,000 deaths of nonsmokers exposed to environmental tobacco smoke would be expected to occur per year. However, this simple estimate does not include many aspects of environmental tobacco smoke exposure, such as the amount of environmental tobacco smoke exposure in the workplace and home, the number of persons exposed to environmental tobacco smoke, and the type and amount of smoke exposure. In fact, studies to evaluate these factors indicate that environmental tobacco smoke causes a higher risk of heart disease than predicted by this simple estimate.

Recently, Steenland⁸ performed extensive analyses of the available literature on the cardiovascular effects of environmental tobacco smoke and predicted that ischemic heart disease could cause as many as 15,000–19,000 deaths yearly of nonsmokers due solely to environmental tobacco smoke from their spouses. Steenland also predicted an overall number of deaths due to environmental tobacco smoke-related cardiovascular disease of 35,000–40,000 yearly, a number similar to the number of deaths estimated by Glantz and Parmley⁵ and Wells.¹⁴ Because the risk of coronary artery disease increases markedly with the number of risk factors,^{1,3,15} nonsmokers with hypertension or hypercholesterolemia and exposed to environmental tobacco smoke are likely to be at even greater risk of developing cardiovascular disease. It is well known that the risk of coronary heart disease caused by voluntary smoking decreases by about

half after 1 year of smoking cessation and after several years approaches that of people who have never smoked.¹⁶ Similar health benefits should occur in previously environmental tobacco smoke-exposed nonsmoking individuals when environmental tobacco smoke is removed from the environment in which they work and live.⁸

Exposure to Environmental Tobacco Smoke

Although the proportion of smokers in the United States is decreasing, 32% of men and 27% of women aged 20 and older smoke cigarettes.¹⁷ These smokers will expose a vast number of nonsmokers to environmental tobacco smoke, and it has been estimated that approximately 50 million nonsmoking adults over age 35 are regularly exposed to environmental tobacco smoke.¹⁷ Additionally, we estimate that 50% of all children live in families with one or more smokers. In a survey conducted in 1979–1980, 63% of nonsmokers reported being exposed to environmental tobacco smoke for more than 1 hour per week, 35% were exposed to environmental tobacco smoke for more than 10 hours per week, and 16% were exposed to environmental tobacco smoke for at least 40 hours per week.¹⁸ It is likely that exposure of nonsmokers to environmental tobacco smoke has decreased in recent years because of the increased public awareness of the hazards of environmental tobacco smoke, increased restrictions on smoking areas, and better ventilation of the workplace. The public has now begun to understand the detrimental health effects of environmental tobacco smoke exposure, but this increased awareness has not eliminated exposure to environmental tobacco smoke of spouses and children living in a smoker's home or that occurring in some workplaces and public buildings.

Cardiovascular Effects of Environmental Tobacco Smoke

Environmental tobacco smoke produces acute effects on cardiovascular function in human studies. In subjects with stable angina, environmental tobacco smoke increases resting heart rate, blood pressure, and blood carboxyhemoglobin, and reduces the duration of exercise that induces angina.^{19,20} Environmental tobacco smoke also produces adverse effects on the exercise performance of healthy people.²¹ Several studies have found increases in the incidence of nonfatal heart disease, including angina and myocardial infarction, among nonsmokers exposed to environmental tobacco smoke.^{22,23}

A few small sample cases show direct involvement between environmental tobacco smoke and peripheral vascular disease. For example, Bocanegra and Espinoza²⁴ reported Raynaud's phenomenon in two successive wives of a chain-smoker. The symptoms of both nonsmokers, as would be expected, subsided after they were no longer exposed to environmental tobacco smoke. Cigarette smoking is a major, preventable risk factor that promotes atherosclerotic peripheral vascular disease,^{1,2} and it is likely that environmental tobacco smoke also increases the risk for peripheral vascular disease, although the latter hypothesis remains to be studied.

Mechanisms of Inducing Cardiovascular Disease

Nicotine, the drug in tobacco that causes addiction, produces acute increases in heart rate and blood pressure.²⁵ Cigarette smoking has been shown to increase platelet aggregation and cause endothelial cell damage.²⁶⁻²⁸ Polycyclic aromatic hydrocarbons present in smoke (for example, benzo[a]pyrene) are capable of inducing and accelerating the development of atherosclerosis.^{29,30} Exposure to environmental tobacco smoke will also increase carbon monoxide levels in red blood cells. Studies indicate that increased carbon monoxide levels in humans result in a more rapid onset of angina³¹ and increased arrhythmias³² in exercising nonsmokers. A recent study indicates that environmental tobacco smoke sensitizes circulating neutrophils in humans and may cause their subsequent activation and oxidant-mediated tissue damage, leading to carcinogenesis and atherosclerosis.³³ It is likely that these and more yet-to-be-identified mechanisms are involved in increasing the risk of heart disease in persons exposed to environmental tobacco smoke.

Potential for Prevention

Although regulation of tobacco products is specifically prohibited under the Federal Hazardous Substances Act, many actions have been taken to protect the health of nonsmokers. For example, cigarette smoking has been banned from air flights in the 48 contiguous states; and as of March 1991, laws restrict smoking in public places in 46 states, in public-sector workplaces in 38 states, and in private-sector workplaces in 17 states.³⁴ Many hospitals, health care facilities, and private and public workplaces are smoke-free. The benefit of restricting smoking in buildings and workplaces is obvious, but the effect of a greater awareness of the importance of reducing environmental tobacco smoke in the home has not been evaluated.

The final conclusion of the 1986 Surgeon General's Report was that separating the smokers and nonsmokers within the same air space may reduce but does not eliminate the exposure of nonsmokers to environmental tobacco smoke. Attempts to control tobacco smoke by increasing room ventilation can be futile, and the only sure way to protect nonsmokers from environmental tobacco smoke is to eliminate smoking from areas that they share with nonsmokers. Environmental tobacco smoke must now be considered an environmental toxin from which the public and workers should be protected. Thus, it is the responsibility of the employer to protect workers, and of public building managers, to protect the public from environmental tobacco smoke exposure. It is the responsibility of parents to ensure that their children are not exposed to environmental tobacco smoke in the home, and the responsibility of everyone to eliminate this health hazard from the environment.⁵

Summary

Although the number of cardiovascular deaths associated with environmental tobacco smoke cannot be predicted with absolute certainty, the available evidence indicates that environmental tobacco smoke increases the risk of heart disease. The effects of environmental tobacco smoke on cardiovascular function, platelet function, neutrophil function, and plaque for-

mation are the probable mechanisms leading to heart disease. The risk of death due to heart disease is increased by about 30% among those exposed to environmental tobacco smoke at home and could be much higher in those exposed at the workplace, where higher levels of environmental tobacco smoke may be present. Even though considerable uncertainty is a part of any analysis on the health affects of environmental tobacco smoke because of the difficulty of conducting long-term studies and selecting sample populations, an estimated 35,000-40,000 cardiovascular disease-related deaths and 3,000-5,000 lung cancer deaths due to environmental tobacco smoke exposure have been predicted to occur each year.

The AHA's Council on Cardiopulmonary and Critical Care has concluded that environmental tobacco smoke is a major preventable cause of cardiovascular disease and death. The council strongly supports efforts to eliminate all exposure of nonsmokers to environmental tobacco smoke. This requires that environmental tobacco smoke be treated as an environmental toxin, and ways to protect workers and the public from this health hazard should be developed. According to a 1989 Gallup survey commissioned by the American Lung Association, 86% of nonsmokers think that environmental tobacco smoke is harmful and 77% believe that smokers should abstain in the presence of nonsmokers. However, programs aimed at further educating the public about the cardiovascular effects on nonsmokers of exposure to environmental tobacco smoke must be strengthened and remain a major component of the AHA mission. A smoke-free environment in the home, public buildings, and workplace should be the goal of society.

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xiii **Author:** JKV Research, LLC, Commissioned by Aurora Health Care and
in Partnership with the City of Milwaukee Health Department:

Title: "City of Milwaukee Community Health Survey."

Year: (2003)

Page: 13; 46

**City of Milwaukee
Community Health Survey**
Summer 2003

Commissioned by:
Aurora Health Care

In Partnership with:
City of Milwaukee Health Department

Prepared by:
JKV Research, LLC



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Respondents were scientifically selected so that the survey would be representative of all city or county adults 18 years old and older. The sample of random telephone numbers included both listed and unlisted numbers. Respondents within each household were randomly selected using the Hagen/Collier selection technique. At least 8 attempts were made to contact a respondent at each household. Screener questions verifying location was included. Data collection was conducted by Management Decisions Incorporated.

The survey was conducted by JKV Research, LLC. For technical information about survey methodology, contact Janet Kempf Vande Hey, M.S. at 920-687-9909 or janet.vandehey@jkvresearch.com. For further information about the survey, contact Mark M. Huber, M.S. at 414-219-2025 or [click here](#).

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Doctor, Nurse or Other Health Professional Advisement to Quit Smoking

Of current smokers...

- Forty-nine percent of smokers reported that a health professional advised them to quit smoking in the past 12 months.
- There were no statistically significant differences between demographic variables and being advised to quit smoking by a health professional in the past year.

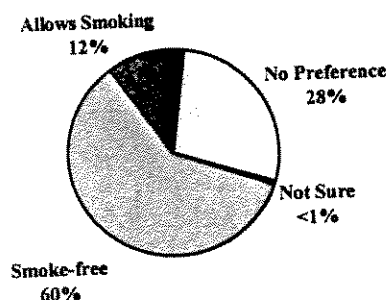
Smoking Indoor or in Vehicle

- All respondents were asked if any smokers in their household smoke indoors or inside their vehicles when others are present. Twenty-two percent reported indoor smoking or vehicle smoking occurs.
- There was no statistically significant difference between households with children and without children.

Smoking Preference in Restaurants

- Sixty percent of respondents reported they prefer to eat in smoke-free restaurants while 12% preferred restaurants that allow smoking. Twenty-eight percent reported they do not have a preference.

Figure 8. Smoking Preference in Restaurants



- As education increased, so did the likelihood of respondents preferring smoke-free restaurants. Fifty-two percent of respondents with a high school degree or less reported this compared to 63% of those with some post high school education and 72% of respondents with a college degree. Fifteen percent of respondents with a high school degree or less preferred restaurants that allow smoking compared to 10% with some post high school and 7% with a college degree.
- Respondents with a household income of at least \$60,001 were more likely to prefer smoke-free restaurants (69%) than those with a household income of \$30,001 to \$60,000 (59%) or those with an income of \$30,000 or less (57%). Preferences for restaurants that allow smoking were similar (13% with a household income of \$30,000 or less, 11% with a household income of \$30,001 to \$60,000 and 12% with a household income of \$60,001 or more).

- Married respondents were more likely to prefer smoke-free restaurants than unmarried respondents (68% and 55%, respectively). Nine percent of married respondents preferred restaurants that allow smoking while 14% of unmarried respondents reported this.
- Seventy-three percent of nonsmokers preferred smoke-free restaurants compared to 27% of smokers. Thirty-four percent of smokers preferred restaurants that allow smoking while 3% of smokers had this preference.

Community Ordinance Prohibiting Smoking in Eating Establishments

- Sixty-one percent of respondents favored a community ordinance prohibiting smoking in eating establishments (35% strongly favor, 26% moderately favor).
- Sixty-two percent of female respondents were in favor of an ordinance compared to 59% of males. Female respondents were more likely to strongly favor an ordinance (41%) compared to male respondents (28%).
- Seventy-four percent of respondents with a college degree favored an ordinance compared to 66% of those with some post high school education and 52% of those with a high school degree or less.
- Respondents with a household income of at least \$60,001 were more likely to favor an ordinance (68%) than those with an income of \$30,000 to \$60,001 (58%) and those with an income of \$30,000 or less (60%).
- Married respondents were more likely to favor an ordinance than unmarried respondents (65% and 58%, respectively).
- Seventy-two percent of nonsmokers were in favor of a smoking prohibition ordinance compared to 33% of smokers. Nonsmokers were much more likely to strongly favor (43%) compared to smokers (16%).

From: Leslie SILLETTI
To: lsille@milwaukee.gov
Date: 2/21/2006 11:50:40 AM
Subject: Re: Aurora: Community Health Surveys: City of Milwaukee

Leslie Silletti
Legislative Research Analyst
Legislative Reference Bureau
City Hall, Room B-11
414-286-2253
lsille@milwaukee.gov

>>> Janet Kempf Vande Hey 02/13/06 12:09 PM >>>
Hello Leslie,

The city of Milwaukee 2003 health study was conducted by telephone through a random digit dial process. With knowing the telephone exchanges and prefixes of the city, a computer randomly generates the last part of a telephone number. As a result, it would include listed and unlisted telephone numbers (and non-working numbers, business numbers, etc., that are weeded out). Genesys Sampling, a highly respected sampling company generated the numbers. Thus, the 1200 completed interviews should represent the city well, although, as you know, lower income households do not always have working phone numbers. This is a limitation to any telephone survey, although Wisconsin has a higher rate of households with telephones than some other parts of the country, which lessens the limitation. We also post-stratified the data by gender/age based on the city of Milwaukee's adult population. This helps correct the issue that typically, fewer males and younger people respond.

I hope this helps, please let me know if you have additional questions.

Janet

Janet Kempf Vande Hey, M.S.
JKV Research, LLC
W4443 Moore Road
Hilbert, WI 54129
Phone & Fax: 920-439-1399

^{xiv} **Author:** The Mellman Group, Inc.

Title: "Survey of 400 likely City-wide Election Voters in the City of Milwaukee, Who Were Interviewed by Telephone March 28-30, 2005."

Year: (2005):

Page: 1.



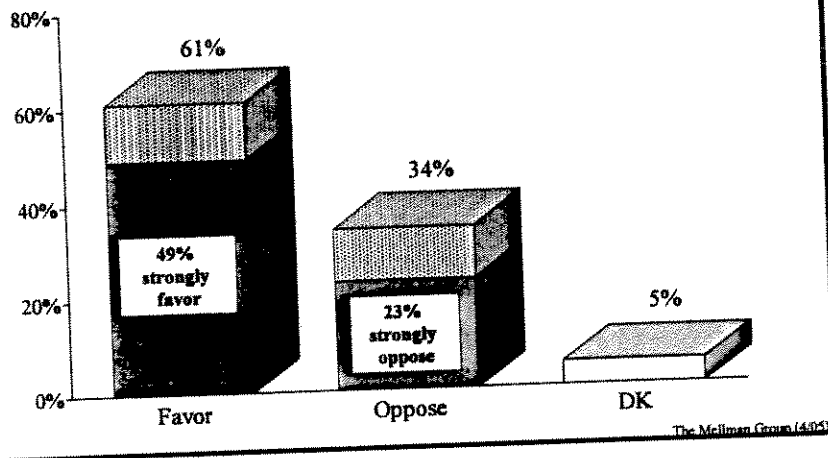
THE
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TO: The Black Health Coalition of Wisconsin, Inc.
FROM: The Mellman Group, Inc.
RE: Clean Indoor Air Ordinance In Milwaukee
DATE: April 11, 2005

The Mellman Group conducted a survey of 400 likely city-wide election voters in the City of Milwaukee, who were interviewed by telephone March 28-30, 2005. The study is based on a listed sample of registered voters, screened for the likely 2004 special electorate. The margin of error for this survey is +/-4.9% at the 95% level of confidence. The margin of error is higher for subgroups.

A Majority Of Milwaukee Voters Favor A City Law That Would Prohibit Smoking In Most Public Places

Would you favor or oppose a city law in Milwaukee that would prohibit smoking in most indoor public places, including workplaces, public buildings, offices, restaurants and bars?



Our recently completed poll of voters in the City of Milwaukee shows nearly two-to-one support in favor of a law that would "prohibit smoking in most indoor public places, including workplaces, public buildings, offices, restaurants and bars." A large, 61% majority supports this law, while only 34% opposes it. Moreover, support for the law is more intense than opposition. Nearly half (49%) say they *strongly* support the law, while less than a quarter (23%) say they *strongly* oppose it.

Support for this law crosses partisan and demographic lines.

Majorities of Democrats (59% favor, 34% oppose), independents (68% favor, 27% oppose) and Republicans (54% favor, 42% oppose) favor the law. Support is equally strong among white voters (61% favor, 34% oppose) and African-American voters (59% favor, 34% oppose), as well as across age and education. Indeed, current smokers are the only segment among whom a majority opposes the law (34% favor, 60% oppose), and they make up only 18% of the city's electorate. However, their opposition is dwarfed by overwhelming support for the law among the much larger group of voters who have never smoked (45% of the electorate, 72% favor, 21% oppose) and former smokers (36% of the electorate, 60% favor, 37% oppose).

The power of the issue is evident in the fact that Milwaukeeans say it will influence their votes. When asked how a candidate's position on the law would affect their vote, 56% of Milwaukee voters say they would be more likely to vote for a candidate who supports the law, while only 29% say they would be more likely to vote for a candidate who opposes the law.

Strong support for the law can largely be attributed to underlying concerns about the danger of second-hand smoke and the rights of customers/employees versus smokers. Altogether, 8 in 10 recognize second hand smoke as a health hazard, with 60% of Milwaukee voters believing second-hand smoke is a "serious health hazard," and another 20% considering it a "moderate health hazard." Nearly half (49%) say that second-hand smoke bothers them a "great deal," with another 22% saying smoke bothers them "some." When asked to judge whose rights have greater priority—customers and employees or smokers—72% say "the rights of customers and employees to breathe clean air in restaurants and bars" are more important, while only 19% say "the rights of smokers to smoke inside restaurants and bars" are more important.

Finally, when read several statements about smoking in public places, Milwaukee voters overwhelmingly agree that restaurants would be healthier if they were smoke-free, that all Milwaukee workers should be protected from second-hand smoke, and that it would be nice to go out to restaurants and bars without smelling like smoke.

<i>% agreeing/disagreeing with statement</i>	Agree	Disagree
Restaurants and bars would be healthier for customers and employees if they were smoke-free	82%	16%
All Milwaukee workers should be protected from exposure to second-hand smoke in the workplace	79%	19%
It would be really nice to go out and enjoy restaurants and bars in Milwaukee without smelling like cigarette smoke when you get home	77%	20%

^{xv} **Author:** Center for Tobacco Research and Intervention, University of Wisconsin Medical School.

Title: "Insights: Smoking in Wisconsin; A Series of Papers on Wisconsin Tobacco Use with Recommendations for Action," based on the 2003 Wisconsin Tobacco Survey of 8,000 Wisconsin adults: "Secondhand Smoke: Awareness, Attitudes and Exposure Among Wisconsin Residents," Series 2, Paper Number 4

Year: (2005)

Page: 4; 6; 8-9.

INSIGHTS: SMOKING IN WISCONSIN

A series of papers on Wisconsin tobacco use with recommendations for action, based on the 2003 Wisconsin Tobacco Survey of 8,000 Wisconsin adults.

Secondhand Smoke: Awareness, Attitudes and Exposure Among Wisconsin Residents

Series 2, Paper Number 4

UW-CTRI

Center for Tobacco Research and Intervention
University of Wisconsin Medical School



University of Wisconsin
Comprehensive Cancer Center



The Wisconsin Department
of Health and Family
Services

EXECUTIVE SUMMARY

Since the 1986 U.S. Surgeon General's Report, *The Health Consequences of Involuntary Smoking*, first made Americans aware of the dangers of secondhand smoke, our understanding of the health consequences of environmental tobacco smoke for both nonsmoking adults and children has expanded greatly. In Wisconsin, secondhand smoke is estimated to cause 700 lung cancer and heart disease deaths each year and thousands more are made seriously ill by asthma, allergic attacks and infectious disease.¹

The 2003 Wisconsin Tobacco Survey (WTS) interviewed over 8,000 Wisconsin smokers, former smokers and never smokers regarding secondhand smoke. This report summarizes the WTS findings and offers recommendations based on those findings. According to the WTS, Wisconsin residents agree that secondhand smoke is harmful, prefer smokefree environments (especially their homes and workplaces) and support of smokefree policies. In fact, approximately 94% of Wisconsin residents overall agree that secondhand smoke is harmful, including 88% of smokers. Younger residents (18-24 year olds) are more likely to find secondhand smoke dangerous than older Wisconsinites. Exposure to secondhand smoke occurs more often, however, among workers with less education, primarily those working in the service/hospitality and manufacturing sectors. These workers are more likely to support changes in smoking policies than those working in sectors where environments are more likely to be smokefree.

Survey respondents generally support smokefree environments, especially in the home and workplace. Respondents were very likely to restrict smoking in their **homes**. Close to 70% of Wisconsin households reported that they completely prohibit smoking. An additional 10% allow smoking in some places or at some times. Only three percent of respondents allow smoking at all times in their home.

Regarding **workplaces**, close to 75% of respondents believe that smoking should not be allowed in indoor work areas (including 55% of smokers). Black respondents preferred stronger workplace policies than Whites. Workers in the entertainment, lodging and recreation industries in particular supported stronger workplace policies on smoking.

While the past ten years has seen a reduction in exposure to secondhand smoke in the workplace, this reduction has not been uniform. Employees of restaurants, taverns and manufacturing facilities, as well as racial and ethnic minorities are more often exposed to secondhand smoke than other groups. Approximately twice as many respondents with a high school education or less were exposed to secondhand smoke in their workplace compared to those with a college degree or more.

Moreover, there was strong support for smokefree **restaurants**. More than 70% of respondents reported that they would support local laws making restaurants smokefree including three-quarters of nonsmokers and half of smokers. More women support smokefree restaurants than men as do more Blacks than Whites. Smokefree restaurants were also more attractive to respondents as customers. Half said they would be more likely to dine in a smokefree restaurant while only six percent said they would be less likely.

Finally, close to two-thirds of respondents supported policies that require **bars and taverns** to be either smokefree or only allow smoking in specific areas. This contrasts with the current situation where few bars are smokefree or have smoking restrictions.

THE RESULTS

KNOWLEDGE OF SECONDHAND SMOKE

HARM FROM SECONDHAND SMOKE

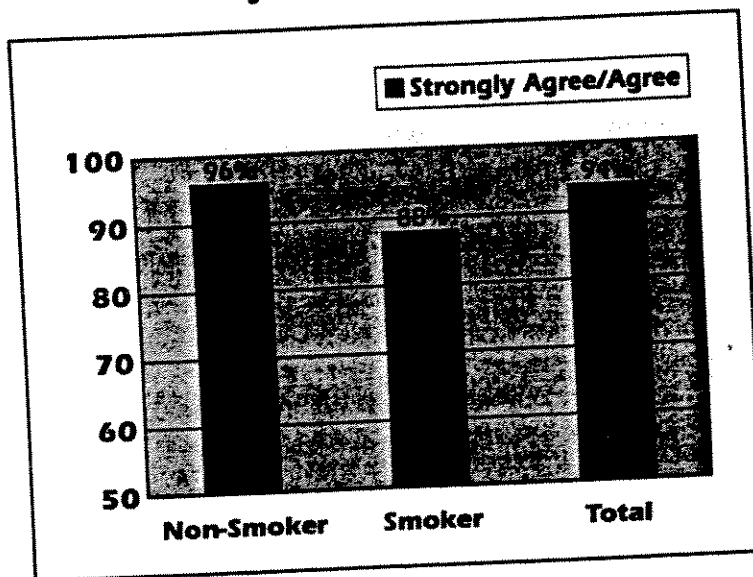
Wisconsin residents almost universally agree that secondhand smoke is harmful (Figure 1). Ninety-four percent of all respondents (96% of nonsmokers and 88% of smokers) agreed or strongly agreed that "breathing smoke from someone else's cigarette is harmful." In response to a similar question, only 15% of survey respondents agreed or strongly agreed with the statement that "secondhand smoke is not as dangerous as people make it out to be."

AGE DIFFERENCES

There is a high level agreement across age groups that secondhand smoke is dangerous to health. Ninety percent of respondents over 65 and those 18-24 years old, 95% of those between the ages of 25-44 and 92% of those between the ages of 24-64 agreed about the dangerous health effects of secondhand smoke. These findings are consistent with earlier surveys of Wisconsin attitudes.⁷

Figure 1

Percent of Respondents Who Consider Secondhand Smoke Harmful, by Smoking Status



THE RESULTS

ATTITUDES TOWARDS SMOKEFREE ENVIRONMENTS

Consistent with their understanding of the harmfulness of secondhand smoke, Wisconsin residents generally support smoke-free indoor environments. Their support is greater for home and workplace environments but is somewhat less for restaurants and bars.

WORKPLACES

Three-quarters of respondents believed that smoking should not be allowed in any part of indoor work areas. Virtually no respondents believed that smoking should be allowed in all areas at work. Even large majorities of smokers approved worksite smoking restrictions—98% of smokers support restrictions on smoking indoors in work areas (Table 2). Also by a two-to-one margin, smokers preferred to strengthen as opposed to weakening smoking policies in their workplace.

Table 2

Preferences of Respondents Regarding Smoking in Indoor Work Areas, by Smoking Status

	Smokers	Former Smokers	Non-Smokers
Allow smoking in all areas	1%	2%	1%
Allow smoking in some areas	18%	43%	24%
No smoking allowed	80%	55%	75%

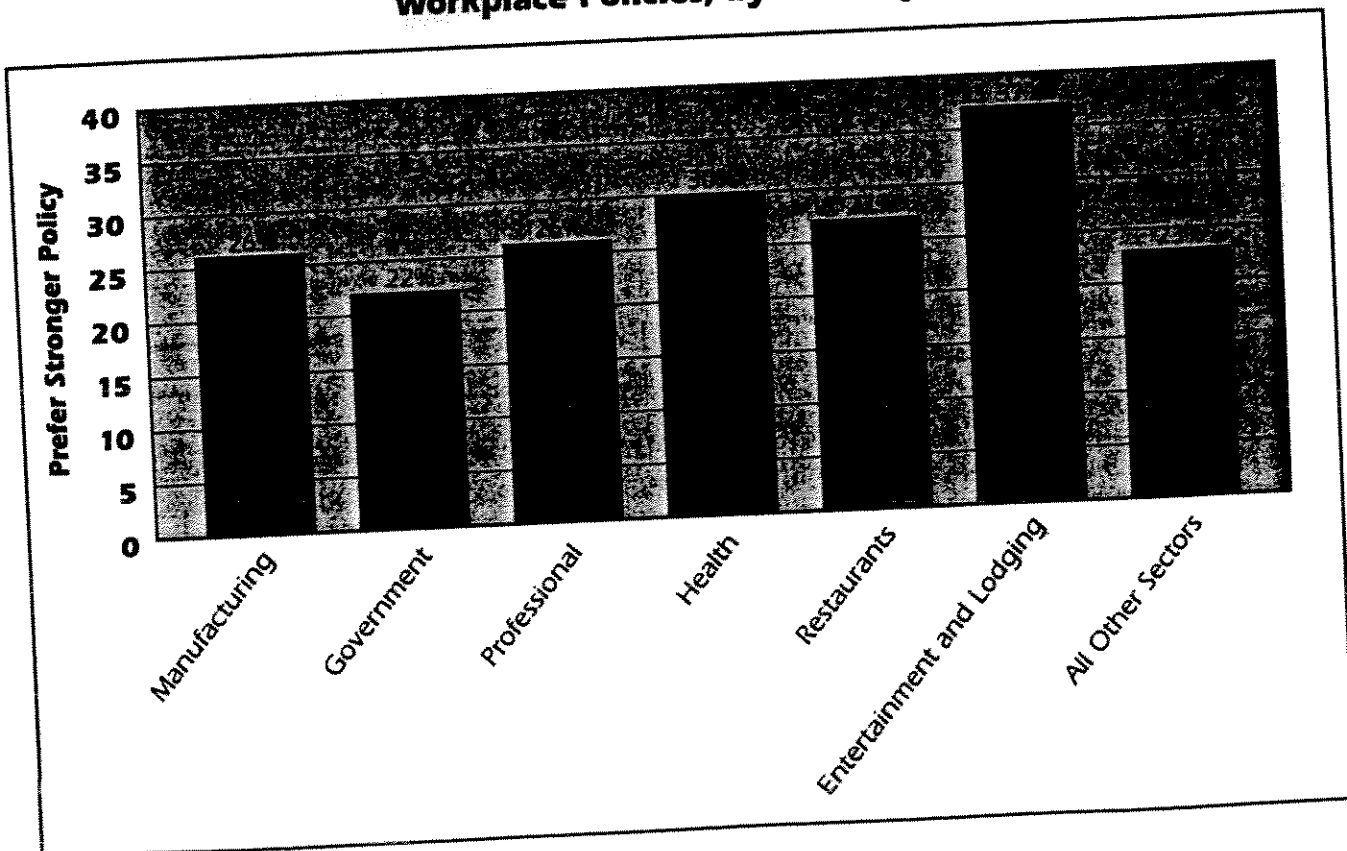
Women were more likely to support such bans as compared to men (57% vs. 43%). A greater percentage of Black respondents prefer to strengthen their workplace smoking policies than do Whites (41% vs. 26%). Views of workplace smoking restrictions do not differ substantially by the age of the respondent.

Despite the large differences in established smoking policies throughout Wisconsin, a majority of respondents do not prefer any policy changes because most workplaces are already smokefree.

However, among those who do want policy changes, support for stronger workforce policies is greatest among employees in the entertainment, recreation, and lodging industries compared to employees in nearly all other industry sectors (37% to 25%). This difference is probably due to the relatively weak policies in those employment sites (Figure 2). Only 1-2% of respondents support weaker policies.

Figure 2

Percent of Respondents Preferring Stronger Workplace Policies, by Industry



^{xvi} **Author:** Smoke-free Milwaukee Project.

Title: "Resolution Campaign."

Year: (April 2005).

SMOKE FREE MILWAUKEE PROJECT

RESOLUTION CAMPAIGN

*The following organizations publicly endorse the creation of
100% smoke free workplace policy in the City of Milwaukee*

4/18/05

ASHA Family Services, Inc.
African Hut Restaurant
Alverno College
American Heart Association
American Cancer Society
American Lung Association
American Academy of Pediatrics-Wisconsin
Chapter
Aro Counseling
Ark of the New Covenant COGIC
Black Health Coalition of Wisconsin
Blue Cross Blue Shield of Wisconsin
Career Youth Development, Inc.
Ceragen Milwaukee
Charles Vang Insurance
Children's Health Alliance of Wisconsin
Children's Health Education Center
Children's Hospital of Wisconsin
Christ the King Church
COA Youth and Family Center
DCS-Directors of Continuation Services
Daughters of Luke Limited
Drea Designs
Elmbrook Memorial Hospital
E.R. Wagner Manufacturing Company
Fighting Back, Inc.
Fokus Family Service Inc.
G-Communications, Inc.
Girl Scouts of America, Milwaukee Area
Global Equity Lending
Great Lakes Contracting, Inc.
Greater Utopian Church

Hampton Asian Food
Hmong American Connection
Hmong American Friendship Association
Infant Death Center of Wisconsin
Integrity Family Services
In Health Wisconsin
Islamic Family & Social Services, Inc.
Knupp & Watson
Language Solutions
La Causa
Latino Health Organization of WI
Lopez Bakery Corporation
Marquette University
Medical Society of Milwaukee County
Medovations
Milwaukee Area Health Education Center
Milwaukee Courier/WNOV Radio Station
Milwaukee Christian Center
Milwaukee Community Tobacco Coalition
Milwaukee Health Department
Milwaukee Health Services Inc.
Milwaukee Public Schools
Milwaukee Public Theatre
NAACP-Milwaukee Branch
National Association of Black Nurses-
Milwaukee Chapter
New Bangkok Restaurant
New Concept Self Development Center
New Covenant Baptist Church
New Hope Missionary Baptist Church
New Testament Central City Church
Noodle House
Northwestern Mutual Life Insurance
Company
Portia's Loving Child Care
Rester & Associates

// Total =
94

Rhino Foods
Sixteenth Street Community Health Center
Smoke Free Wisconsin
Stark Investment
Stuck Wood Works, Inc.
St. Francis Hospital, Inc.
St. Gabriel's COGIC
St. Joseph Regional Medical Center
St. Michael Church (Hmong Community)
St. Michael Hospital
Strive Media Institute
Thai Vang Insurance Agency
UMOS
United Christian Evangelical Church
United Church in Milwaukee
United Community Center
UW Center for Tobacco Research and
Intervention
Vang Insurance Services
WCS-Thurgood Marshall House
White Buffalo Intertribal Store
Wisconsin Association of School Nurses
Wisconsin Association of School Nurses-
District 6
Wisconsin Asthma Coalition
Wisconsin Community Service
Wisconsin Hospital Association
Wisconsin United Coalition of Mutual
Assistance Associations, Inc.
Xiong Corporation

